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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,143	03/16/2004	Toshihisa Takeyama	KON-1860	3282

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EXAMINER	
ANGEBRANNDT, MARTIN J	

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1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,143	TAKEYAMA, TOSHIHISA	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims should recite the wavelength of exposure in the irradiating step. While it is clear that the composition is sensitive to that wavelength, it is not clear if the 532 nm wavelength is used in the exposure.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4,6-10,14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '551.

Korishima et al. JP 05-046061 teaches composition for forming volume holograms where a dye cation [0007] and a borate anion [0008-0010] are combined with a free readical polymerizable systems using ethylene based compounds such as acrylic or acrylate monomers [0012]. Example 1 uses a cyanine dyes with a triphenyl-butyl boarate anoin combinaed with N,N-dimethylaniline, polyvinylbutyral, vinyl carboazole and 2-phenoxy acrylate coated on a glass plate. These were exposed using an 830 nm laser forming the interferences fringes and then

finally cured using a halogen lamp thereby forming a reflection hologram. [00189-0022]. The sensitization is different from that of other photocurable composition, being much improved in the red and infrared. [0003-0004,0023]. Useful cyanine dyes including trimehtine dyes (first formula), pentamethine dyes (second dye) and heptamethie dyes (third through fifth dyes) are disclosed [0007].

Dhar et al. '551 teach in example 1, an acrylate monomer and CGI-784 as the photoinatiator mixed with matrix precursors dibutyltin dilaurate, diisocyanate terminated polypropylene glycol and dihydroxypolypropylene glycol, which are heated (13/65-15). Examples 3 and 4 are similar and place the composition 270-290 microns between two 200 micron glass slides with a spacer and after curing of the matrix are used to record holograms (the ratio is 0.675-0.725). The ability to form thick recording layers of more than 200 microns is disclosed. (3/13-19,4/3-12). Useful photoactive monomers including acrylates are disclosed as useful in this system. (6/51-67). A reduction is shrinkages of the hologram is also realized (7/1-48). The use of various reactions including hydrosilation and the like to form the matrix is disclosed. (6/26-50). The recording of holograms using 532 nm laser light is disclosed. (8/8).

It would have been obvious to one skilled in the art to modify the cited example of Korishima et al. JP 05-046061 by using the trimethine dye disclosed as the first dye in section [0007] and by adding the components to form an in-situ matrix and place the composition between two glass slides with a spacer of 200-500 microns to allow a thicker hologram to be formed and reduce shrinkage as discussed by Dhar et al. '551.

The applicant apparently has interpreted the references as the N,N-dimethylaniline being the counter ion. This is not the case. Even casual review of formula (2) on page 4 of Korishima

et al. JP 05-046061 shows the cyanine dye to be the counter ion. The examiner notes that cyanine dyes are specifically disclosed and claimed by the applicant. The positive charge (making it cationic) is shown on the nitrogen of the right pyridine ring of the cyanine dye. The applicants analysis is flawed on its face. The applicant argues that there is no motivation to use the dye/borate of the claims in the secondary references. The examiner holds that the modification asserted in the rejection is to add the precursors to allow the formation of the matrix and the thicker holographic recording medium, and starts form a reference using the dye/borate. There is a reasonable expectation of success found in the secondary references which use free radically curable systems with their matrix (such as acrylates) as does Korishima et al. JP 05-046061. **The closest prior art is Korishima et al. JP 05-046061, not Dhar et al.** Further, it is clear from Korishima et al. JP 05-046061 that the sensitivity will be different from other photoinitiation systems, as its sensitivity in the red and infrared is heightened. [0003-0004,0023]. Therefore the data asserted by the applicant's representative as unobvious is not. The rejection stands.

The applicant argues that Korishima et al. JP 05-046061 only exposes using IR light. This is sufficient to obviate the rejection for the methods claims, but not the claims directed to the medium. The claims to the medium are interpreted as only requiring sensitivity to 532 nm laser radiation. The position of the examiner is that the trimethine cyanine dye illustrated would render the composition sensitive to a doubled Nd:YAG laser, which emits at 532 nm. The examiner notes the trimethine cyanine dyes, C-5 through C11, disclosed in the instant application at page s 49-51. The examiner has previously addressed the issue of comparison with Korishima et al. JP 05-046061, rather than comparing with the secondary references, as the sensitivity is due to the photoinitiator/sensitizer, not the binder. It makes little sense to compare with a different

class of photosensitizer and argues a difference when a more similar one is used in the prior art and the photosensitivity is based upon the sensitizer, not the binder/matrix. As this is the case, the comparison is not with the closest prior art and in the case of the claims directed to the composition commensurate in scope with the coverage sought. **The applicant is invited to compare with the trimethine cyanine dye identified above to establish unobvious results in comparison with the closest prior art. The methods claims have been interpreted as requiring a sensitivity to 532 nm laser radiation, but not requiring that this be used as the exposure wavelength.**

6. Claims 1-4,6-10,14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '551 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988).

Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988) teaches the use of cyanine dye borate photoinitiators tocure acrylate based compositions. These are exposed using 532 nm light from a Nd:YAG laser and have a sensntivity across the visible spectrum while other photoinitiators are sensitive only to blue light in the visible. (2326, left column). The polymerization is initiated by the generation of an alkyl or aryl radical

To address the case bounded by the claims, where a YAG laser is used, the examiner cites Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp

2326-2328 (1988) to evidence that trimethine cyanine dye:borate complexes sensitize photopolymerizable compositions to the visible range including 532 nm, which is also disclosed as useful in recording holograms by Dhar et al. '551.

7. Claims 1-4,6-10,12,14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Hegel et al. '008.

Hegel et al. '008 teach in example 1, an acrylate monomer and IRG-784 as the photoinatiator mixed with matrix precursors dibutyltin diacetate, diisocyanate terminated polypropylene glycol and dihydroxypolypropylene glycol, which are placed between 1.2 mm APO substrates with a 500 micron spacer and after curing of the matrix [0031-0040] (this yields a ration of 02.8). The formation of holograms using these is disclosed. [0052-0056]. Useful photoactive monomers including acrylates are disclosed as useful in this system. [0029]. A reduction is shrinkages of the hologram is also realized. The provision of antireflection coatings on one or both of the substrates is disclosed. [0016,0018]. The substrates may be 0.5-1.3 mm thick [0019]. The use of various materials for the substrate, including glass and plastics, is disclosed. [0016].

It would have been obvious to one skilled in the art to modify the cited example of Korishima et al. JP 05-046061 by adding the components to form an in-situ matrix and place the composition between two glass slides with a spacer of 500 microns to allow a thicker hologram to be formed and reduce shrinkage as discussed by Hegel et al. '008. Further it would have been obvious to modify the resulting medium by having substrates of the same or different thicknesses on either side of the recording composition.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

8. Claims 1-10 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '104.

Dhar et al. '104 teach in example 1, an acrylate monomer and CGI-784 as the photoinatiator mixed with matrix precursors dibutyltin dilaurate, diisocyanate terminated polypropylene glycol and dihydroxypolypropylene glycol [0091-0092], placed between two750 micron PMMA discs with a 750 microns spacer and the matrix cured [0096-0101] (the ratio is 0.50) . The ability to form thick holographic recording layers of more than 200 microns is disclosed [0072]. Useful photoactive monomers including acrylates are disclosed as useful in this system [0030]. A reduction in shrinkage of holograms is also realized (7/1-48). The use of various reactions including hydrosilation and the like to form the matrix is disclosed.. The matrix can also be made form polyols, which are fluorinated [0027]

It would have been obvious to one skilled in the art to modify the cited example of Korishima et al. JP 05-046061 by adding the components to form an insitu matrix and place the composition between two glass slides with a spacer of 200-500 microns to allow a thicker hologram to be formed and reduce shrinkage as discussed by Dhar et al. '104.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

9. Claims 1-4,6-10,14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '551, further in view of Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion

pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988).

Gottschalk et al '541 teach the use of dye borate complexes to cure free radical polymerizable systems. The cationic dyes may be methine, polymethine, triarylmethane, indolene, thiazine, xanthene, oxazine, acridine, cyanine, carbocyanine, hemicyanine, rhodamine and azomethine dyes. (5/25-6/54). The initiation is described as more efficient because of the close association of the dye, which absorbs the light, and the borate anion, which generates the free radical and facilitates the transfer of the energy from the excited dye to the borate. (3/4-14). The use of trimethine dyes is taught for dyes 1-3, 8 and 9 which describes their use with visible light of greater than 500 nm (4/16-19 and columns 7-10)

Adair et al. '414 teach the use of cationic transition metal complexes with borate anions to cure free radically polymerizable systems, where the ligands on the complexes can be pyridine, bipyridines, phenanthrolines (the latter have two chelation sites) and the like (4/37-6/49). The use of this initiator system to form holograms is disclosed (11/36-45).

To address the other embodiments bounded by the claims where the dye cations are not cyanine, the examiner holds that it would have been obvious to one skilled in the art to modify the composition rendered obvious by the combination of Korishima et al. JP 05-046061, and Dhar et al. '551 by using other known dye/borate photoinitiators such as those taught by Gottschalk et al. '541 or Adair et al. '414 with a reasonable expectation of the free radical components in the resulting combination being photocurable in the visible range based upon the common usage of free radically curable monomers in all the references and the disclosure that trimethine cyanine dyes:borate complexes are sensitive to 532 nm radiation by Chatterjee et al.,

"Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988). Further, it would have been obvious to one skilled in the art to modify the invention by using a 532 nm Yag laser to recod the hologram based upon the disclosed sensitivity of the dye borate compounds to this radiation in Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988) and the use of 532 nm laser to record holograms by Dhar et al. '551. Noting that the spacing of the fringes and hence the replay wavelength is dependent upon the wavelength of the laser used in the recording process.

The applicant repeats the argument of the ammonium cation, which has been addressed above. The applicant also argues that the dyes of Adair et al. '414 are not within formula 2. The examiner points to fact that the ligands are not limited to those illustrated in section of the [0075] of the instant specification. The applicant could exclude the ligands of Adair et al. '414, but has chosen not to do so, so the position argued is flawed. Further based upon the fact that Gottschalk et al. teaches cyanine dye/ borate initiators,which embraces those of Korishima et al. JP 05-046061 and uses them for the same purpose (photoinitiation), the argument that they are not combinable by the applicant are unconvincing.

As discussed above, the applicant's analysis is flawed as it begins from the wrong reference. Specifically the Korishima et al. JP 05-046061 is the closest reference for the reasons discussed above. **The applicant is invited to compare with the trimethine cyanine dye identified above to establish unobvious results in comparison with the closest prior art.**

10. Claims 1-10,12-14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '551, further in view of Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988), further in view of Hegel et al. '008 or Dhar et al. '104.

To address other embodiments bounded by the claims, the examiner holds that it would have been obvious to modify the media rendered obvious by the combination of Korishima et al. JP 05-046061 with Dhar et al. '551, Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988) by adding an AR coating to one of the substrates as taught by Hegel et al. '008 and/or to using other matrix materials such as the siloxane or fluorinated polyols taught by Dhar et al. '104 with a reasonable expectation of forming a useful holographic recording medium based upon the use of these features in holographic recording media in these references.

11. Claims 1-4,6-10 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korishima et al. JP 05-046061, in view of Dhar et al. '551, further in view of Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988), further in view of Horimai et al., WO 02/15176.

Horimai et al., WO 02/15176 (Hormai et al. '891 is US equivalent) teaches with respect to figure 1, a holographic recording medium which comprises a substrate (2), a holographic recording layer (photopolymers) (3), a second substrate (4) and a reflective layer (5). The

reflective layer and the recording layer can be next to each other (12/5-23; 11/40-64). The interference fringes results from the interferences from the light passing through the layer toward the reflective layer and that reflected back into the laser from the reflective layer. (col 5. ?; 4/53-5/7).

In addition to the basis provided above, it would have been obvious to one skilled in the art to modify the embodiments rendered obvious by the combination of Korishima et al. JP 05-046061, with of Dhar et al. '551, further in view of Gottschalk et al. '541, Adair et al. '414 and Chatterjee et al., "Electron transfer reactions in cyanine borate ion pairs: photopolymerization initiators sensitive to visible light", J. Am. Chem. Soc., Vol. 110(7) pp 2326-2328 (1988), further in view of as set forth above by adding a reflective layer on the further substrate as taught Horimai et al., WO 02/15176 to allow holographic recording without a second beam.

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-4,8-10 and 12-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application No. 11/201,815 (US 2006/0040185) in view of Korishima et al. JP 05-046061.

It would have been obvious to one skilled in the art to modify the claims of the copending application 11/201,815, by using photopolymerizable compounds and initiators known to be useful with them in the formation of holographic patterns, such as those disclosed by Korishima et al. JP 05-046061 with a reasonable expectation of forming a useful holographic recording medium.

This is a provisional obviousness-type double patenting rejection.

The applicant stated that a terminal disclaimer might be filed at a later date.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Campbell et al. '045 teaches optical recording media substrates used in forming holographic memory cells can be 0.1 to 1 mm thick. (12/49-64). This patent is refereed to in Dhar et al. '551 (at 12/10-14) and Dhar et al. 104 [0060].

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

9/18/2007